UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,855	02/07/2006	Junichiro Nakayama	63004(70868)	5425

21874 7590 09/17/2010

EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
SLUTSKER, JULIA	

ART UNIT	PAPER NUMBER
2891	

MAIL DATE	DELIVERY MODE
09/17/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,855	NAKAYAMA ET AL.	
	Examiner	Art Unit	
	JULIA SLUTSKER	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 March 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/09/2009; 06/02/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Drawings are objected because Figure 11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 6 is objected to under 37 CFR 1.75(c) as being in improper form because it depends on a multiple dependent claim 5. See MPEP § 608.01(n). Accordingly, the claim 6 is not been further treated on the merits.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Jung (US 2002/0179004).

Regarding claim 1, Jung discloses a laser processing method for crystallizing an amorphous material by irradiating a layer formed of the amorphous material constituting a substrate or a layer formed of an amorphous material on a substrate with a laser beam, comprising: irradiating a first region defined on a surface of the layer formed of the amorphous material with a laser beam so that the amorphous material in the first region is melted ([0050], Fig.5A, E1); solidifying and crystallizing the molten amorphous material in the first region ([0051]); irradiating a second region that is defined on the surface of the layer formed of the amorphous material (Fig.5A, E2) and overlaps the first region in a predetermined portion thereof (Fig.5A, F) with a laser beam so that the amorphous material in the second region is melted ([0053]); solidifying and crystallizing the molten amorphous material in the second region ([0051)]; moving a region that is to be irradiated with a laser beam in a predetermined direction by a predetermined distance (Fig.5A, E3)), and newly defining a first region on the surface of the layer formed of the amorphous material so as to partially overlap a immediately previous second region (Fig.5A, F); and repeating irradiation of the laser beam on the surface of the layer formed of the amorphous material and movement of a region that is to be irradiated with the laser beam ([0055], [0056]) until a crystalline region of the amorphous material reaches a desired size (Fig.5C).

Regarding claim 2, Jung discloses that the first and the second regions are defined as a rectangle shape on the surface of the layer formed of the amorphous material (Fig.4).

Regarding claim 5, Jung discloses that the first region and the second region intersect with each other (Fig.5B).

5. Claims 1, 3, and 4 rejected under 35 U.S.C. 102(b) as being anticipated by Park (US 6, 326, 286).

Regarding claim 1, Park discloses a laser processing method for crystallizing an amorphous material by irradiating a layer formed of the amorphous material constituting a substrate or a layer formed of an amorphous material on a substrate with a laser beam, comprising: irradiating a first region defined on a surface of the layer formed of the amorphous material with a laser beam so that the amorphous material in the first region is melted (Fig.7A); solidifying and crystallizing the molten amorphous material in the first region ([column 7, lines 5-15); irradiating a second region that is defined on the surface of the layer formed of the amorphous material (Fig.7B) and overlaps the first region in a predetermined portion thereof with a laser beam so that the amorphous material in the second region is melted (Fig.7B; column 7, lines 40-50)); solidifying and crystallizing the molten amorphous material in the second region (column 7, lines 45-50); moving a region that is to be irradiated with a laser beam in a predetermined direction by a predetermined distance (column 7, lines 50-55), and newly defining a first region on the surface of the layer formed of the amorphous material so as to partially overlap a immediately previous second region (Fig.7B); and repeating irradiation of the

laser beam on the surface of the layer formed of the amorphous material and movement of a region that is to be irradiated with the laser beam until a crystalline region of the amorphous material reaches a desired size (Fig.7C).

Regarding claim 3, Park discloses that the first and the second regions on the surface of the layer formed of the amorphous material are defined as a sawtooth shape (Fig.16; numeral 162).

Regarding claim 4, Park discloses that the first and the second regions are defined on the surface of the layer formed of the amorphous material as an arch shape (Fig.8).

6. Claims 7 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka (US 2003/0024905).

Regarding claim 7, Tanaka discloses a laser processing apparatus which crystallizes an amorphous material by irradiating a layer formed of the amorphous material constituting a substrate or a layer formed of an amorphous material on a substrate with a laser beam, comprising: a light source ([0086]) for emitting a laser beam (Fig.3, 110a, 110a, 100c); a first projection mask (Fig. 3, numeral 112a; [0086], since grating is used to shape a laser beam, (112a) is considered as a projection mask); provided in an optical path of a laser beam (110a) formed between the light source and the layer formed of the amorphous material (106) so as to define a first region on as surface of the layer formed of the amorphous material by letting the laser beam emitted from the light source pass through (113a); and a second projection mask (112b) provided in an optical path of a laser beam formed (110b) between the light source and

the layer formed of the amorphous material (106) so as to define a second region on the surface of the layer formed of the amorphous material by letting the laser beam emitted from the light source pass through (113b).

Regarding claim 8, Tanaka discloses a first laser light source (Fig.18, numeral 100a) for emitting a laser beam for irradiating the first region and a second laser light source (Fig.18, numeral 100b) for emitting a laser beam for irradiating the second region.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung as applied to claim 1 above, and further in view of Okumura (US 6, 372, 039).

Regarding claim 6, Jung does not disclose that the amorphous material in a molten state in the first or second regions is irradiated with an additional laser beam.

Okumura however discloses using an additional laser light source (Fig.9, numeral 601) for emitting a laser beam for irradiation the amorphous material in a molten state in the first or second regions (column 8, lines 57-67).

It would have been therefore obvious to one of ordinary skill in the art at the time the invention was made to modify Jung with Okumura to have the amorphous material in a molten state in the first or second regions is irradiated with an additional laser beam

for the purpose of increasing uniformity of crystal grain size (Okumura, column 2, lines 10-20)

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as applied to claim 7 or 8 above, and further in view of Okumura (US 6, 372, 039).

Regarding claim 9, Tanaka does not disclose (1) an additional laser light source for emitting a laser beam for irradiation the amorphous material in a molten state in the first or second regions; (2)wherein a wavelength of laser light emitted from the additional laser source is longer than a wavelength of laser light emitted from said layer light source.

Regarding element (1), Okumura however discloses using an additional laser light source (Fig.9, numeral 601) for emitting a laser beam for irradiation the amorphous material in a molten state in the first or second regions (column 8, lines 57-67).

It would have been therefore obvious to one of ordinary skill in the art at the time the invention was made to modify Tanaka with Okumura to have an additional laser light source for emitting a laser beam for irradiation the amorphous material in a molten state in the first or second regions for the purpose of increasing uniformity of crystal grain size (Okumura, column 2, lines 10-20)

Regarding element (2), Okumura discloses irradiating by first and second laser pulse having different micro-crystallization threshold values (Fig.8A, column 14, lines 21-45). Okumura also discloses that micro-crystallization threshold values depend on a wavelength of the laser pulse (column 7, lines 35-45).

It would have been therefore obvious to one of ordinary skill in the art at the time the invention was made to adjust a wavelength of laser light emitted from the additional laser source for the purpose of optimization the micro-crystallization threshold values and obtaining crystal grain uniformity (Okumura, column 15, lines 26-35).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JULIA SLUTSKER whose telephone number is (571)270-3849. The examiner can normally be reached on Monday-Friday, 8 a.m.-5 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keisha Bryant can be reached on (571)-272-1844. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julia Slutsker/
Examiner, Art Unit 2891